Case Study: ICICI Bank Towers Reduces Energy Use by 15% Through No-Cost and Low-Cost Operational Measures

Building Summary

ICICI Bank Towers is a 60,380 square meter office building located in the Bandra-Kurla Complex in Mumbai, India. The building was completed in 1999, incorporates green design concepts and materials, and has been studied by the Confederation of Indian Industry in collaboration with the Indian Green Buildings Council.

Actions Taken

Building managers have demonstrated that energy savings can be achieved through active energy management strategies, even in a building designed to be exceptionally energy-efficient. The building's original design includes numerous energy-efficiency features, including daylighting, green rooftops, and double glazed, low-emissivity windows.

The building management team has tracked energy consumption carefully over the past five years and uses performance data to maintain continued savings. Monthly consumption is analyzed to identify potential problems early and identify areas for improvement. Building managers have implemented a range of operational measures and low-cost technology upgrades to further reduce energy consumption, resulting in a 15% reduction (1.6 million kWh) in annual energy use:

- Building Management Measures: ICICI's building management team achieved savings of 1,372,000 kWh per year through several innovative energy management measures:
  - **Optimized Lighting Controls**: The building control system was programmed to reduce artificial lighting in daylit atrium areas when not needed, so that several hundred lamps are used ony when necessary to maintain desired lighting levels.
  - **Scheduled Cleaning of Filters and Coils**. The building operators clean and maintain air filters and chiller coils according to an established schedule. This improves air flow and heat transfer, significantly improving HVAC system efficiency.
  - **Free Cooling and Pre-Cooling:** The building management team began free cooling in 2002 based on outdoor air temperature, using the building's automated control system. During cooler weather, the building can often be adequately cooled by bringing in outside air, which reduces chiller energy use. Pre-cooling of the building is also implemented through the automated control system, typically between 2:30-4:30AM from September through December. When outdoor air is below 23 degrees C, fans run continuously to bring outside air into the building (the chiller is not used during this time). This technique inexpensively lowers the temperature of the building and its contents during the night, which reduces chiller energy use the following day.

- **Garage Ventilation Optimization**: Carbon monoxide (CO) sensors are used to control 18 5.5-kW garage fans. Using the sensors, the fans cycle on and off to maintain safe levels of CO at all times. This ensures that these fans do not run when they are not necessary.
- **De-Lamping**: In the parking garage area the original design was overlit, and lighting fixtures were removed, while remaining fixtures were reduced from the original 130 Watts per fixture to 60 Watts per fixture.

♦ Lighting Retrofit: 400 100-Watt incandescent lamps, and 700 50-Watt halogen lamps were replaced with 11-Watt CFLs. These lamps are operated 70 hours per week, and the retrofit resulted in an additional 228,000 kWh in annual energy savings, and reduced annual energy costs by approximately Rs. 1,181,040 (or US$ 30,000). Lamp replacement costs of $2200 were offset by energy savings in less than one month.

Results

The overall result of its improved energy management and retrofit program has been a 15% reduction in annual electricity use. This has included savings of 1,372,000 kWh in savings through management strategies, and an additional 228,000 kWh through limited retrofits. A key related result of reducing energy use over the past two-year period has been a 14% reduction in the building's peak demand.

Contact Information

For more information on the eeBuildings program, to find out about upcoming trainings and events, or for general information on how to reduce building energy consumption using simple, low-cost operational measures, go to www.epa.gov/eeBuildings or write to eeBuildings@epa.gov.

The U.S. Environmental Protection Agency's eeBuildings (energy-efficient Buildings) www.epa.gov/eeBuildings program helps building owners, managers, and tenants improve the energy performance of their buildings. Drawing on the expertise of ENERGY STAR, eeBuildings connects financial and environmental performance to energy efficiency.

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